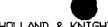
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U.S.S.N. 09/909,574 Filed: July 20, 2001

AMENDMENT AND RESPONSE TO OFFICE ACTION

## In the Claims

Please enter the following amendment.

(once amended) A method for producing polyhydroxyalkanoates comp ising 1. providing genetically engineered organisms which express enzymes selected from the group consisting of diel exidered actuse, aldehyde dehydrogenase, acyl-CoA transferase, acyl-CoA synthetase, B-ketothiolase, acetoacetyl-CoA reductase, and PHA synthase,

providing diols which can be converted into hydroxyalkanoate monomers by enzymes expressed by in the organisms, wherein

the organisms are transformed with genes encoding enzymes selected from the group consisting of diol oxidoreductase and aldehyde dehydrogenase, wherein

diol oxidoreductase and aldehyde dehydrogenase convert 1,4 butanediol into hydroxyalkanoate monomers, and

culturing the organisms under conditions wherein the hydroxyalkanoate monomers are polymerized to form polyhydroxyalkanoates.

- (original) The method of claim 1 wherein the diol is 1,6-hexanediol and the 2. hydroxyalkanoate monomer is 6-hydroxyhexanoate.
- (original) The method of claim I wherein the diol is 1,5-pentanediol and the 3. hydroxyalkanoate monomer is 5-hydroxyvalerate.
- (original) The method of claim 1 wherein the diol is 1,4-butanediol and the 4. hydroxyalkanoate is 4-hydroxybutyrate.

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- (original) The method of claim I wherein the diol is 1,3-propanediol and the 5. hydroxyalkanoate monomer is 3-hydroxypropionate.
- (original) The method of claim 1 wherein the diol is 1,2-ethanediol and the 6. hydroxyalkanoate is 2-hydroxyethanoate.
- (original) The method of claim 1 wherein the diol is 1,2-propanediol and the 7. hydroxyalkanoate is 2-hydroxypropionate.
- (original) A genetically engineered organism for use in the method of claim 1 comprising an organism which expresses the aldH and dhaT genes.
- (original) The organism of claim 8 wherein the organism is selected from the 9. group consisting of Escherichia coli, Ralstonia eutropha, Klebsiella spp., Alcaligenes latus, Azotobacter spp., and Comamonas spp.
- (once amended) A system for making polyhydroxyalkanoates comprising and 10. organism genetically engineered to express enzymes selected from the group consisting of a diol oxidoreductase, aldehyde dehydrogenase, acyl-CoA transferase, acyl-CoA synthetase, βketothiolase, acetoacetyl-CoA reductase, and PHA synthase, wherein the organism is transformed with genes encoding enzymes selected from the group consisting of diol oxidoreductase and aldehyde dehydrogenase, and wherein the organism can convert diols into hydroxyalkanoate monomers which are polymenzed to form polyhydroxyalkanoatcs

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wherein the organism can convert diels into hydroxyalkanoute monomers which are polymerized to form polyhydroxyalkanoutes.

- 11. (original) A composition comprising a polyhydroxyalkanoate copolymer which includes
- 2-hydroxypropionate or 2-hydroxyethanoate or both, and at least one comonomer selected from the group consisting of 3-hydroxybutyrate, 4-hydroxybutyrate, 3-hydroxypropionate, 2-hydroxybutyrate, 4-hydroxyvalerate, 5-hydroxyvalerate, 6-hydroxyhexanoate, and 3-hydroxyhexanoate, having a weight-average molecular weight (Mw) of at least 300,000.
- 12. (Once amended) The composition of example claim 11 where the comonomer is 3-hydroxybutyrate.
- 13. (Once amended) The composit on of example claim 11 where the comonomer is 4-hydroxybutyrate.
- 14. (Once amended) The composition of example claim 11 where the comonomer is3-hydroxypropionate.
- 15. (Once amended) The composition of example claim 11 where the comonomer is 2-hydroxybutyrate.
- 16. (Once amended) The composition of example claim 11 where the comonomer is 4-hydroxyvalerate.

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- (Once amended) The composition of example claim 11 where the comonomer is 17. 5 hydroxyvalerate.
- (Once amended) The composition of example claim 11 where the comonomer is 18. 6-hydroxyhexanoate.
- (Once amended) The composition of example claim 11 where the comonomer is 19. 3-hydroxyhexanoate.
- (original) A method for improving a biological system for making 20. Polyhydroxyalkanoates with an organism genetically engineered to express enzymes selected from the group consisting of a diol oxidoreductase, aldehyde dehydrogenase, acyl-CoA transferase, acyl-CoA synthetase, β-ketothiolase, acetoacety-CoA reductase, and PHA synthase, wherein the organism can convert diols into hydroxyalkanoate monomers which are polymerized to form polyhydroxyalkanoates, the method comprising selecting for mutants with increased enzyme activities by
- i) introducing mutations into a specific host, and
- ii) screening pools of the mutants generated for increased ability to synthesize PHA from a elected diol or diols.
- (original) A DNA fragment encoding a diol exidoreductase and an aldehyde 21. dehydrogenase, wherein the expressed enzymes can produce hydroxyalkanoate monomer selected from the group consisting of 3-hydroxybutyrate, 4-hydroxybutyrate, 3hydroxypropionate, 2-hydroxybutyrate, 4-hydroxyvalerate, 5-hydroxyvalerate, 6-

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hydroxyhexancate, 3-hydroxyhexanoate, 2-hydroxypropionate, and 2-hydroxyethanoate from diol.

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